coating to reduce corrosion is applicable in subcombination to a disk drive head element, where the head element is separated from the other disk drive components.

The invention disclosed herein further comprises a method of reducing corrosion of a disk drive head element by applying a protective coating to the head element after opening the disk drive housing and removing the head element from the disk drive housing. In addition, a method of protecting a disk drive head element from corrosion during shipping is disclosed, whereby the method comprises applying the protective coating to a new head element, or in the case of a previously assembled disk drive, removing the head element from the disk drive and applying a protective coating, placing the head element into a container and transporting the container. Finally, a method of protecting a disk drive head element from corrosion during storage is disclosed, whereby the method comprises of the steps of removing the head element from the disk drive, applying the protective coating and placing the head element into a storage container.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of a disk drive of the present invention;

FIG. 2 is a bottom perspective view of a slider and head element;

FIG. 3 is a side elevation view of a slider and head element with a protective coating applied;

FIG. 4 is a flowchart depicting the basic steps of two methods of the invention;

FIG. 5 is another flowchart depicting optional steps of two methods of the invention.

While the following disclosure describes the invention in connection with one embodiment, one should understand that the invention is not limited to this embodiment. Furthermore, one should understand that the drawings are not to scale and that graphic symbols, diagrammatic representatives, and fragmentary views, in part, may illustrate the embodiment. In certain instances, the disclosure may not include details which are not necessary for an understanding of the present invention such as conventional details of fabrication and assembly.

DETAILED DESCRIPTION

Referring first to Fig. 1, the disk drive 2 is contained within a disk drive housing 10. The disk drive 2 includes one or more disks 12 for the storage of information, and an actuator arm 14 that is rotatable about a shaft 16. A slider 18 is disposed at the distal end of the actuator arm 14, and the read/write transducer or "head element" 20 is typically positioned at or near the trailing end of the slider 18. (See FIGs. 2, 3) The actuator arm 14 can rotate about shaft 16, thereby allowing head element 20 to access the disks 12 and read information from and write information to the disks 12. Information is transmitted to the head element 20 by way of a flexible circuit board 22.

When closed, the lid (not shown) of the disk drive 2 compresses a seal (not shown) which is positioned between the underside of the lid and the outer wall of the housing 10. The seal and a filter 24 within the disk drive 2 aid in maintaining an atmosphere within the disk drive 2 that is relatively free of corrosive materials. Additional or different filters may be added as needed.

Initial testing of a post-assembly disk drive results in exposure of the sensitive thin metal layers or films of the head element 20. Accordingly, upon subsequent opening of the disk drive housing 10 to access its interior, for example, to perform repairs or rework associated with the contents of the disk drive 2, the relatively corrosive free environment of the disk drive housing 10 is compromised, thereby allowing potentially corrosive materials within the atmosphere of the local environment to reach the interior contents within the disk drive 2, including the head element 20 and its exposed sensitive read/write surfaces. Therefore, to reduce possible corrosion of the head element 20, upon a reworking of the disk drive 2, the head element 20 is removed from the disk drive housing 10 and a protective coating is applied to the head element 20.

Referring now to Figs. 2 and 3, the head element 20 is relatively small and is typically located at one end of the slider 18, which in turn, is attached to actuator arm 14 by a suspension assembly or load beam 26. (See Fig. 1) The relatively small size of the head element 20 renders it physically difficult to apply a protective coating 28 to only the head element 20. Accordingly, given the relative difficulty in applying a protective coating 28 to only the head element 20, for purposes of ease of handling, it is preferable in the case of an assembled disk drive to remove the slider assembly 18 with the head element 20 attached thereto, and subsequently apply a protective coating 28 to both the head element 20 and slider 18, or in the case of assembling a new disk drive, apply a protective coating 28 to the HSA or head-gimbal assembly (HGA).

Fig. 4 is a flow diagram which discloses the basic steps of performing two related methods of this invention, one relating to reworked disk drives and the other to new disk drives. First, in the case of an existing disk drive, the disk drive is opened at block 40,